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OUR SOCIETY*

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Wilmington, Del.

As your President, it becomes a pleasant duty to voice praise to the men of science and the humanitarians who have spoken to you today and who will speak to you tomorrow upon the latest contributions of medical progress, with particular stress and vigor on the medical and surgical advances during these trying times. The world today owes a singular debt to medicine in all of its branches for its knowledge and efficiency and devotion in prevention of disease and epidemics, for skill and perfection in the care of the wounded and distressed, and creating new hope in those who have become incapacitated and discouraged.

In this changing world both socially and economically we physicians have a singular duty to perform in creating in our Society a wealth of knowledge that will be available and of service to all. Medicine in itself is undergoing revolutionary changes as well as kaleidoscopic social changes in which medicine is involved. There is no escape for us from the duties herein involved. If the physicians can participate in and guide these changes all will profit more. If we do not, others will, for the public knows better all the time just what medicine offers to human beings in the way of guidance, comfort, and protection.

Why the Wagner-Murray-Dingell Bill, and Senator Pepper's senatorial investigating committee and subcommittee on wartime health and education, and the Maternal Child Health Act of 1945? Under this Act, if passed, 40 million children and two million mothers will join the "Free-Care" parade. With such legislation staring medicine in the face, it would be logical to ask: "Are these reforms schemes to get votes, or are they ones to create a system to regiment the doctor and his patient and control and license all medicine from a central bureau?" It has been brought out by public investigators that there are about 82 million subjects in the United States who do not get the proper, thorough medical assistance which we doctors are more or less responsible for. With such knowledge at hand, and contemplated legislation, as aforementioned, it makes it appear that the doctors have fallen down on the job.

But surely it cannot be said that we have failed scientifically. Through our devotion in creating these scientific medical facts we have also created gadgets, tests, and systems that are expensive for the common man. To aid in the correction of these conditions, we medical men and women possess information needed by the law-makers and other public servants. No other group is qualified, either by education or experience to carry out these responsibilities of medical citizenship.

This Society intends to do its part, and it behooves us as individuals to get back of and aid and assist in creating reforms wherever needed in our state so that these objections, whether individual or political, will be satisfied.

In our state we have hospitals conveniently placed so that all of our citizens are within one-half hour's ride by auto. These institutions could and should be organized as community medical centers where low-cost medicine can be thoroughly done. No doubt, if such centers should be created, they would require financial assistance from local and state charities, but should be at all times under the control and direction of the immediate local physicians and their appointed workers.

We can further aid this by encouraging our members to act and participate in the development of plans which will provide for easy payment of insurance against unusual or prolonged illness. Then we must encourage our citizens to participate in a more general use of such existing facilities. It is necessary to educate the people to the importance of the pre-payment plans now available. To insure

*Presidential Address, read before the Medical Society of Delaware, Wilmington, October 9, 1945.

effective medical care for the indigent it is necessary to encourage and provide state or local financial aid rather than Federal subsidies. This Society, at all times, should cooperate with individuals and groups directly affected, such as professions, manufacturers, distributors, labor, and insurance adjusters, so that steps can be taken to bring relief and provide a method of meeting the cost of illness and hospitalization.

The press and the radio are the instruments of choice that should be used to educate the public. Through these instruments it is our duty as a Society, to inform our citizens just what we doctors have been doing and the facilities that are now available in our state that we, more or less, aid and subscribe to without remuneration. We should come out of our temples and counteract these political socialists who would destroy by regulation the principles of the doctor-patient relationship by making the public believe, through propaganda, that we are unable to keep our house in order and then by setting up bureaus antagonistic to American medicine.

Let us not forget the facts that in the short span of 150 years American medicine has moved forward to a position of universally recognized world leadership. It has proved a more effective and a more widely and evenly distributed medical care than ever has been made available anywhere else at any time. If analyzed, this achievement is without parallel in the progress of mankind. With such an achievement we should call on the press and radio to present a fair and true picture of the criticisms of medicine that are abroad in our land today and, as a Society, we should do our part in keeping our journalists properly informed as to the truthfulness of this propaganda emanating from these bureaus which are many, now located in America. It is true, medical economics and public relations have been somewhat neglected by American medicine, but under the stimulas of pressure groups who wish to change us and our country the sense of our responsibility to the public has been awakened, and now we recognize our duties as doctors that we are not only to treat the ill but also to become leaders in medical direction whether it be politico-social or socio-economic, as it affects each community.

Quoting the Editor of the Journal of the American Medical Association: "On September 6 President Harry S. Truman sent to Congress an outline of the executive and legislative program which he considered desirable. He said, 'I shall shortly recommend a national health program to provide adequate medical care for all Americans and to protect them from financial loss and hardships resulting from illness and accident.' He further stated: 'The Congress has also been giving consideration to legislation with respect to the construction of hospitals and health centers throughout the country. The federal government must continue to recognize its obligation to maintain and improve the health of the nation by providing federal grants where necessary for the construction of hospital and health centers.'

"These citations are but a meager indication of the innumerable problems related to the health and medical care of the people of the United States that will concern the Congress at this session. The medical profession must be alert to the legislative proposals that will be developed by the Congress in response to the suggestions of the President. Translation of these suggestions into legislation may introduce innumerable features of fundamental importance to the future of the practice of medicine in our country."

So there it is! "The seeming truth which cunning times put on to entrap the wisest."

Today we stand on the threshold of a new era in medicine, and as a Society we should make a more definite contribution toward molding the pattern of the future practices of the art and science of healing. We should take a keener interest in medical public relations and economics as it affects our guild. We should mold the thoughts of our legislators against the idea of national socialization of medicine. The flow is admitted by every realist to be in that direction. Some day it may be reversed, but until then its diversion is our number one job.

As Oliver Goldsmith, M.D., expressed it:

"Ill fares the land, to disease and death a prey
Where bureaucrats accumulate and doctors decay."

References:

J. A. M. A.
Medical Economics
National Physicians Committee

WAR-TIME HEALTH AND EDUCATION AND ITS SIGNIFICANCE IN PEACE-TIME MEDICAL CARE*

Senator James M. Tunnell
Georgetown, Del.

Members of the New Castle County Medical Society, it may be considered somewhat presumptuous on my part to address a medical society on the subject of health. In other words, I am supposed to meet you gentlemen and discuss your life work, your own chosen profession. I should hesitate to do so except on the theory that each person, perhaps in the whole world, seems to be a specialist on health. Seldom is there a greeting from one friend to another which does not proceed on the assumption that one or the other, or both of the persons meeting, were specialists on health, either their own or the other fellow's.

Medical men are in a very fortunate position. They have, to a very great extent, the confidence and respect of the remainder of the world. They greet us at our birth, alleviate the pains of our living, and ease our departure. The physician is the first to greet us, and in many instances, the last to bid us farewell. He, more than the members of our family, knows the precarious hold which we have upon life. He knows, nearer than anyone else, the probability of our life's span. He, more than anyone else, can give the likely date of our demise. He knows our dispositions, our feelings, and in most instances our prospects. He sees us at our physical worst. We don't appreciate him until we are at our worst. Under war-time conditions he has seen us at his physical worst. His relation to us is the most intimate one. He is called when he becomes a necessity. When we want him, we want him badly.

This is not true of all professions. There is a great deal of difference of opinion throughout the world as to whether the lawyer is a blessing to mankind or not. There seems to be no question in the mind of the average man of the world as to the blessing of the physician. It is possible for one to live and die without ever needing the services of an attorney. It is practically impossible for one to live and die without having needed the services of a physician. The population of the world is in need of more physicians than can be obtained.

In 1740, the population of the world was estimated by Struyck at five hundred millions. The population of the world is now estimated at two billion, two hundred millions. Unquestionably, the possible population of the earth depends very largely upon the physicians of the world. The fact that the population of the globe within the last two hundred years has multiplied by four is largely to be credited to the increase in medical attention and medical precautions.

Our forefathers did not realize that they were suffering from a lack of medical attention. Our grandmothers doctored their families. The home remedies were administered for every ailment until it was believed that the last sickness had arrived. The result of increased and better medical attention has been an increase in the life of the average man and woman. Alexander conquered the world and died at thirty-three, Peraius died at twenty-eight, Sallust died at fifty-two, Lucretius died at forty-three, Catullus died at thirty. Men worked rapidly in those days. They feared they did not have long to work.

Out of a hundred of our own population today, at the age of ten, fifty-three survive to be sixty-eight years old. Out of a hundred Romano-Egyptians, not as many as nine survived to sixty-eight. In antiquity at the early ages of life, the expectation was much below that which we enjoy today. The advantage in favor of modern population becomes less and less as the individual advances in years. The expectation of life of the Roman was just a little over twenty years. From the age of sixty on, the Romans are said to have done just a little better than we. Only those outstanding in health and strength reached the age of sixty among the Romans.

At the end of the Nineteenth Century, in the United States, the average length of life was forty-eight years for males and fifty-one for females. The figures for 1910, according to Glover, are an expectancy of 49.33 for males, and 53.06 for females. The Foudray table for 1920 shows an expectation of 54.07 years for white males and 56.56 for white females. The tables for the period of 1929 to 1931 give the expectancy at 59.29 for white

* Address delivered before the New Castle County Medical Society, Wilmington, September 18, 1945.

males and 62.63 for white females. In other words, for the thirty years between 1900 and 1930, there was an average addition of thirteen years to the lives of both sexes. Undoubtedly, the length of life has continued to increase from that period on.

This corresponds very well with the increase in the number of physicians. In 1850 there were approximately 40,000 doctors, surgeons, and healers of all kinds in the United States. In 1870 there were 64,000, in 1890 there were 104,000, in 1910 there were 151,000, in 1930 there were 153,000 physicians and surgeons, in 1940 there were 165,000 physicians and surgeons, and in 1942 there were 180,000 physicians and surgeons.

Some writers tell us that medical practice has lagged behind medical science. This is a tendency that is usual in every realm. The physician must deal not alone with human diseases, but with human beings, human whims, human dispositions, and human determination. Perhaps diagnosis has shown as much improvement as has any branch of the physician's work. A physician in practice in 1800 had no stethoscope, no blood pressure machine, and no X-ray machine. He could not count the blood cells, he could not determine the hemoglobin. The average physician had very little mechanical help. In addition, he was supposed to treat and cure every form of human ailment. He had no hospitals and no specialists, and very limited access to medical libraries.

Man has advanced in every line. The physician is not alone in the improvement of his facilities. This improvement is equally true in law. In my own experience of thirty-eight years, I have seen the aids to lawyers increased immeasurably. When I began the practice of law, each lawyer diagnosed his own cases, passed his own opinions on the legal principles involved, and made his own decisions. Today he can find cases involving the same principle and frequently the same facts which have been decided in courts of last resort. If he doesn't find those cases his opponent does. He has not only the principles but the decisions on the facts involving those principles and the decisions of the best legal minds. The same is true as to medicine. Of course, the victim of the mistakes of the lawyer sometimes lives.

I once heard an eminent teacher say that if the college professor was able to teach his student where to find knowledge and to enable him to read intelligently a James Almanac that the college had done well in that student's education.

At Washington we have a Congressional Library with several millions of volumes. In these volumes is set out the written record of human knowledge. It does not matter in what line you want information, it can be found in the Congressional Library. One also has trained assistants in the finding of that information. If one is able to identify his facts, as described in textbooks and commentaries, he is not compelled to determine his course of treatment. He can find the judgment of the wisest of men to assist him in his determination.

In medicine, methods of treating various ailments have changed rapidly in the last century. A gall bladder was first removed in 1882. About the same period a floating kidney was anchored. The first appendectomy operation for a perforated appendix was performed in 1886. The patient died. It is said now that appendicitis has become fashionable. The mortality rate in prostate gland operations in patients over seventy was one and six-tenths per cent in the Mayo Clinic in one test that was made. In every line medicine and surgery have advanced. The past hundred years has been a century of clinical progress.

The conquest of epidemic diseases has been one of the greatest victories of medical science. This has been the result, very largely, of the study and understanding of bacteriology. The name of Chapin is connected with the theory that germ diseases spread by contact. Physicians have a clearer idea of the prevention of diseases than ever before.

It is sometimes claimed that specialism is overgrown. There was a time when man attempted to become familiar with every branch of human knowledge. This was not confined to medicine. Thomas Jefferson was an illustration of this tendency to master many lines of accomplishments. He succeeded to a remarkable degree. He was a farmer, author, musician, architect, inventor, traveler, horseman, naturalist, philosopher, mathematician, linguist, scholar, manufacturer, builder, edu-

cator, executive, legislator, politician and statesman. Vinci was a painter, sculptor, astronomer, and an inventor. Sir Christopher Wren was not only a great architect but a great mathematician and astronomer. Bacon was a lawyer, scientist, logician and philosopher. It was not considered impossible that a Jack of all trades might indeed be a master of several.

Vice President Marshall was the son of a country physician. He at one time said that he wished we could have a physician who could treat more than a single square inch of the human body. He remembered the general practice of his father. However, the cost of modern diagnosis and modern treatment has made it practically impossible for the average physician to be as well prepared for diagnosis of all cases, and frequently for treatment, as the specialist. There cannot be a specialist in every country town or closely collected in any section of the country. It is impossible to have a modern hospital in every little town. It is impossible to have a specialist in each line of medicine in close proximity to each person who might need his services. In other words, we don't need as many specialists as we do physicians. The modern scientific instrument frequently requires a great deal of money to purchase or to operate it. It would not pay the average physician or a specialist to have the instruments for every line of medical endeavor. World War Two was a revelation to the people of the world with reference to the healing of the wounded. The American army and navy taught the world how to win a war. They taught the rest of the world how to destroy human life and property. They were also to teach the remainder of the world how to save lives.

General Patton told us in Germany that ninety-eight per cent of the wounded who reached a hospital alive recovered. He told of one particular serviceman who was wounded in North Africa. The General said that in the first World War a puncture of the gut was fatal. He told of seeing this young man in North Africa during World War Two with a punctured stomach, two broken legs, a chest wound, and arms fractured. He told us that that man survived and is alive and well. Sulpha and penicillin were wonderful sources of treatment resulting in recovery in World War Two. While instruments of destruction of human life were increasing in power, the medical profession had increased its ability to save those who were wrecked but not destroyed.

Cornell tells us that civilization has succeeded in making life infinitely less hazardous than it was in the past, but the task is by no means completed. He states that improvements have been achieved in only a small number of countries and that over one-half of the population of the world still lives under atrocious health conditions and has not benefited by the progress of medical science. One who visits Asia and Africa soon realizes that medical science has a long road to travel before it begins to increase in efficiency in those lands. There are eighty-one counties in the United States in which there is no regular physician. The problem is a particularly difficult one because health cannot be brought to people while they are kept on a low standard of living. This applies to the United States as well as to other portions of the world. In fact, conditions of health are, to a very great extent, in proportion to the amount of money expended to protect health. The child born in families where the income is low frequently does not have the same opportunity for life and health as does the child born under conditions where his health can be scientifically protected.

I, in the early part of this year, was in Rabat, Tunisia, Casablanca, Jerusalem, and other cities of Asia and Africa, where all kinds of disease was rampant. In particular, I was impressed with the conditions in Rabat in North Africa. I went down one of the narrow streets in the old quarter of Rabat where there were numerous things for sale. I didn't see a thing that I wanted to buy. Conditions were too terrible for that. I met there the filthy, the blind, the crippled, the beggar, and an exhibit of almost every kind of disease. I pulled my clothes to me to prevent too much contact, though the streets were crowded and avoidance of contact was almost impossible. These people are almost more helpless than we have ever imagined that people could be, from the standpoint of disease. Blindness, in particular, seemed to be prevalent. Here we saw the Arab in his

native habitat; we saw a race of people who have not improved in custom or financial standing or methods of life since the days of Moses. Their huts, their wells, their camels, their sheep, and their cattle are all in much the same condition as they must have been in the days of Moses. A herd of beef cattle in North Africa would be a revelation to the Arabs. One of our Generals said to me that if health conditions were improved in North Africa the population would double so quickly that we would soon have a starvation problem on our hands.

In Puerto Rico we find that since the United States took over this island, the population has increased from about 800,000 to more than two millions. Health measures have caused the population to increase more rapidly than business and industrial activities have increased. The result is that we have an unemployment problem in Puerto Rico which is serious. With two-thirds of the population of the world without any serious effort having been made to improve their condition, there is still much to be done from a medical standpoint. There are so many unsolved medical problems. The plague seems to have been conquered to a very great extent. However, influenza, in its epidemic of 1918 and 1919, took a death toll of ten million lives. Polio has increased in recent years. There are methods of treating the patient with the idea of preventing permanent disability, but the way to prevent polio is not so clear. The common cold does not usually kill people, but it creates more temporary disability than any other disease and medical science is unable to prevent it, and I might say, unable to cure it. Cancer has not been entirely conquered. Diseases of heart and circulation cause a high mortality. Arthritis, rheumatism, and other chronic diseases are a constant reminder to the medical world that there are other worlds to conquer.

The Selective Service System has shown the great number of physical defects in highly developed America. It has been estimated that 40 per cent of the twenty-two million men of military age, or between eight and nine million men are unfit for general military duty. There are four and one-half million men who are 4Fs and who remained unfit for military service after all doubtful cases had been re-examined. Approximately one and one-half million men with major defects have been inducted and rendered fit for duty, including a million men with major dental defects, more than two hundred fifty thousand men with impaired vision, one hundred thousand with syphilis, and more than seven thousand with serious hernia. During 1942 and 1943 more than fourteen and one-half million cases were treated by the army's dental program with thirty-one million fillings and a replacement of six million teeth. One and one-half million bridges and dentures were supplied. This work required fifty-three million sittings by patients. What the effect of this great number of decayed teeth shows upon the health of the victims is unknown.

According to the National Health Survey conducted by the United States Public Health Service in 1935, more than twenty-three million people in the United States had a chronic disease or a physical impairment. In the working age group, between 15 and 64 years of age, more than three million people had impairments such as deafness, blindness or orthopedic handicaps and more than a million were estimated to have hernia. Out of 11,495 individuals in 2,480 farm families residing in twenty-one rural counties in seventeen states in 1940, ninety-six per cent of those examined had significant physical defects. Only one person of each one hundred examined was found in prime physical condition. Among nearly one hundred fifty thousand young people examined by physicians for the National Youth Administration in 1941, eighty-five per cent needed dental care, twenty per cent needed eye refractions, nineteen per cent needed tonsillectomies and twelve per cent special diets. About one-third of the young people had health defects which limited their employability.

One great advantage which America has by reason of World War Two is that the physical defects of its young men were brought into public notice. In America industrial casualties take a heavy toll. From Pearl Harbor to January 1, 1944, 37,600 American workers were killed on the job, 7,500 more than the military dead for the same period. More than one-half million workers were permanently disabled and four and one-half million were temporarily disabled. In 1943 the average male industrial worker lost 11.4 days

and the average female industrial worker 13.3 days due to sickness and injury. Application of these figures to the number of employed male and female workers in the United States today indicates a loss of more than six million man-days annually. This is forty-seven times the amount of time lost through strikes and lock-outs of all kinds in 1943. During the period of 1900-1940 the death rate in the United States fell from 17.2 per thousand to 10.8 per thousand, a reduction of nearly sixty per cent. The death rate from typhoid and parathyphoid, for example, was reduced by ninety-seven per cent; from diarrhea and enteritis by ninety-two per cent; from diphtheria, by ninety-seven per cent. However, only 615 of the 3,070 counties in the United States had full-time local Public Health Agencies. According to the U. S. Public Health Service, nearly 5,000 communities need new water systems, approximately 6,500 communities need water extensions. New sewerage systems are needed in 7,700 communities and there are more than 2,800 incorporated communities with a total population exceeding 25,000,000 that do not have any form of sewage treatment. Approximately five million, two hundred thousand rural homes need improved or new water supplies; more than 846,000 rural homes are without toilet facilities altogether.

The United States Public Health Service, in Hagerstown, Maryland, has observed the health of school children in that town over a period of years. Recently, the Selective Service medical records of Hagerstown registrants were compared with the school health records obtained by the examination of the same individuals during their childhood. The comparison showed that many of the defects for which the registrants were rejected for the Army had been discovered as much as fifteen years earlier while the registrants were still in high school and grade school; the defects having remained uncorrected and unimproved.

There is a greater responsibility upon the physician of today than rested upon the physician of a hundred years ago. You have better libraries, you have better instruments, you have better schools, and you have better facilities for reaching your patients. The increased facilities carry with them the increased obligation to benefit mankind. The opportunity ripens into a duty to your fellowman.

Since the commencement of World War Two, there has been much fear that a sufficient number of medical students could not be obtained to keep up the high standard of medical treatment which prevailed before the War. However, as the war has now ended, the hope is that we will not be thus handicapped. Forty per cent of our counties with an aggregate population of more than fifteen million, have no registered hospitals. An investigation in North Carolina in rural areas showed that seventy-three per cent of the population lived in rural areas where there were only thirty-one per cent of the state's physicians.

The medical profession of the world, are the ones upon whom must rest the duty of teaching the rest of mankind to realize his medical necessities and to avoid the medical pitfalls to which the race is exposed. From the medical missionary to the family physician of the United States, there is the opportunity, the necessity, and the obligation to leave the world in a better and happier state than when he himself began his career. Leaving aside the thought of the increase in length of life which can be brought about by the physician, let us consider the blessings of greater happiness in the world from improvements in health conditions. Seldom do we find the sick man or the sick woman entirely happy. Decreases in physical ills bring increases in human happines. Increases in medical treatment and skill bring increased health. Long may the physician in all his branches and all his skill continue to bless our families and our homes by his attention and frequently by his ill-paid sacrifices.

Postgraduate Course in Allergy

The American College of Allergists offers an intensive practical course in allergy for 5½ days, November 5 to 10, inclusive, at Thorne Hall, Northwestern University, Superior and Lakeshore Drive, Chicago, Illinois. Men in the service will be admitted free of charge, and for others the registration fee is $100.

Inquiries should be addressed to the Secretary of the American College of Allergists, 401 La Salle Medical Building, Minneapolis 2, Minnesota.

CLINICAL CASES FROM THE HOSPITALS

CHRONIC ARTERIOVENOUS FISTULA OF TRAUMATIC ORIGIN*

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With the increase in the occurence of vascular injuries resulting from the late war, it seems appropriate to present a case of arteriovenous fistula of traumatic origin and to discuss some of the clinical features observed.

No attempt will be made to discuss the recognition and immediate treatment of arteriovenous fistulas. The subject of arteriovenous fistula and aneurysm has been discussed in the excellent papers by Reid, Holman, Matas, and Elkin, and others.

The majority of arteriovenous fistulas are traumatic in origin, a small number are congenital, and a few are the result of primary vascular disease, usually syphilis. Trauma is produced most commonly by gunshot, stabbing, and fragments of exploding missiles.

REPORT OF CASE

No. 65446. Admitted 11/9/44
Discharged 12/20/44

Thirty-two year old, well developed, well nourished, colored male, who was first seen the early part of November, 1944, in the surgical out-patient department, complaining of enlarged veins of the left leg and thigh, ulcer of the left leg, pain and swelling of the left leg and thigh which was increased by exertion.

Present Illness. Four years previously the patient was struck by a bullet which penetrated between the two bones of the lower right forearm, then struck the pubic region in the mid-portion just above the symphysis, penetrating the soft tissues of the mid-lateral aspect of the left thigh about 2½ inches below the greater trochanter. The wound in the arm healed without incident, and the bullet in the thigh was removed by his referring physician six weeks prior to his admission here. Immediately following injury, the patient was hospitalized in an institution in Maryland and remained there for three weeks. During that time he noticed tenderness and swelling in the left femoral area with numbness and pain which radiated down the medial aspect of the left thigh and leg.

Following discharge from that hospital, the patient was unable to work for four months because of numbness and swelling of the left leg and thigh and pain which increased with exertion. Since that time up to the date of admission, the patient had gradual increase in swelling of the left thigh and leg with later development of large varices on the entire lateral and anterior aspect of left thigh and lower leg. About one year before admission he developed an ulcer in the mid-lateral aspect of the leg which increased in size and resisted treatment. At no time since receiving the injury had the patient had any dyspnea during exertion or while at rest.

Examination. Thirty-two year old, well nourished, colored male, who did not appear to be ill. Heart was not enlarged either to auscultation or percussion. There was a harsh systolic murmur heard at the apex and transmitted to the precordium. Average pulse was 79 per minute, pulse being regular and full. Blood pressure in the right arm was 100/60. Lungs clear. Liver was not enlarged. The right arm showed a small scar on the dorsal surface, mid-part of the lower forearm indicating the point of entrance of the bullet. There was no anatomical deformity or functional impairment of this arm.

Located in the mid part of the pelvis, immediately above the symphysis, there was a small scar which indicated the point of entrance of the bullet in this region. On the mid-lateral aspect of the left thigh, 2½ inches below the greater trochanter, there was another small scar indicating the point at which the bullet was extracted by the referring physician six weeks before. The left thigh and leg were larger than the corresponding right extremity. There were numerous huge varices on the entire anterior and lateral aspect of the thigh and leg (Fig 1). There was a clear-cut, punched-out, clean, 3 cm. ulcer on the mid-lateral aspect of the left leg with surrounding induration and pigmentation. The left foot and leg were slightly colder than the corresponding right extremity. There was no palpable pulsation of the left dorsalis

*From the Surgical Service, Memorial Hospital.

pedis or posterior tibial arteries. There was only a slight pulsation of the left popliteal artery.

Immediately below the left Poupart's ligament, there was a small pulsating tumor with a palpable thrill which was continuous. On auscultation over this area there was a continuous bruit which showed accentuation during systole. This bruit could be heard along the course of the vessels as far downward as the mid part of the thigh and upward for about 4 inches above Poupart's ligament. Firm compression over this pulsating mass, 1½ inches below Poupart's ligament, produced complete disappearance of the thrill and bruit, but did not alter the character of the pulsation of the peripheral arteries. With dampening of the bruit on compression, there was an immediate drop in pulse rate from 79 to 54 per minute with elevation of blood pressure to 120/90 (Branham's bradycardic phenomenon). The neurological examination was negative.

Calorimetric readings on 11/13/44 showed about a one degree F. decrease in the temperature of the skin of the left leg and foot as compared to the opposite extremity. Recheck of this determination three weeks postoperatively showed an elevation of skin temperature of the affected extremity to almost a normal level as compared with the other extremity.

Oscillometric readings on 11/13/44 showed a decrease in the amplitude of the pulsation compared to the opposite extremity. Recheck of this examination three weeks postoperatively revealed no significant change.

X-ray studies of the heart and lungs 11/13/44 showed a hypertensive type of heart outline with left ventricular enlargement the interventricular diameter being 17.5 cm. The lungs were clear and the aorta was normal. Recheck x-ray of the heart three weeks postoperatively revealed an essentially normal heart outline, the interventricular diameter being 15 cm., this being a decrease of 2½ cm. from the previous examination.

X-ray of the pelvis and femur on 11/13/44 in the region of the greater trochanter showed an irregular calcified area having the apapearance of an old sinus tract, which probably represented the tract of the bullet. Nothing abnormal could be seen in the bone proper.

Arteriogram 11/15/44. Twenty cc. of 35% diodrast was injected into the femoral artery proximal to the fistula and x-ray plates were taken immediately and during the course of injection. No definite conclusions could be drawn from this procedure because of lack of experience in interpretation and evaluation of x-ray film associated with arterio-venous fistula.

Circulation time 11/20/44. One-half milliliters of ether was injected in the corresponding veins of the ankles of both legs. The circulation time in the left leg was 3 minutes and 18 seconds, and in the right leg was 1 minute and 18 seconds. Examination of the

Fig. 1
Varices due to arteriovenous fistula. Course of bullet indicated by markers on pubis and external aspect of thigh.

circulation time 11/23/44 was again carried out with injection of sodium decholin, injection being made in corresponding veins of the ankles and the results were: left leg, 2 minutes 17 seconds; right leg, 45 seconds.

Blood presure determination on admission was: left arm, 100/60; right arm, 120/60. Left popliteal space, 90/70; right popliteal space 145/70.

Laboratory studies: 11/9/44—Kline negative. R.B.C., 4,560,000. Hemoglobin, 13½

gms. Differential normal. Urinalysis showed nothing remarkable.

Operation. 11/29/44 under continuous spinal anesthesia, a vertical incision about 4 inches in length along the course of the femoral artery, beginning about 1 inch above Poupart's ligament and extending downward, was made. Section was continued down to expose the femoral vesseles immediately below Poupart's ligament. The femoral nerve was exposed and retracted. On exposure of the common femoral artery and vein proximal to the fistula, the artery was seen to be slightly enlarged, very thin walled, presenting the usual characteristics of a vein (venification of the artery). In contrast, the femoral vein was enlarged about twice its normal size, thick walled, presenting characteristics usually found in an artery. The femoral artery distal to the fistulous opening was smaller than usual, with only a small pulsation, the femoral vein being approximately of normal size and thickness. Exposure of this region was found to be rather difficult due to the scar tissue resulting from previous injury. It was noted that the fistulous opening appeared to be located between the adjacent common femoral vessels about 1½ cm. just proximal to the profundi femoral vessels. The common femoral vessels were individually and doubly ligated immediately below Poupart's ligament with heavy black silk and ¼ inch umbilical tape. Vessels distal to the ligature were tied and divided. The descending femoral artery and vein were individually and doubly ligated with heavy black silk immediately distal to the origin of the profundi femoral vessels. Profundi femoral vessels were individually isolated, clamped, and ligated with heavy black silk and the intervening fistulous tract excised. During excision of the profundi femoral artery, this vessel was inadvertently nicked before clamping and a powerful gush of blood filled the wound, indicating the adequacy of the collateral circulation. This was controlled by a clamp without difficulty.

TABLE I

	Rt. Leg	Lft. Leg	Lft. Leg 3 Wks. Postop.
2 inches below trochanter	21¾ in.	25 in.	24 in.
Mid-thigh	19¾ in.	22½ in.	20¾ in.
Just below patella	14½ in.	15¾ in.	15 in.
1 inch above malleoli	9 in.	9½ in.	9¼ in.

Comparative diameters of legs before and after operation.

On opening the resected specimen of common femoral artery and vein, a smooth intimal-lined fistulous tract between the adjacent surfaces of the artery and vein was found.

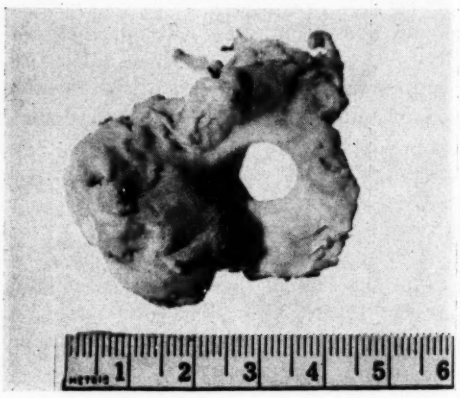

Fig. 2
Arteriovenous fistula
Resected specimen

The opening of the fistula measured 1.2 cm. in diameter (Fig. 2). Poupart's ligament was approximated to Gimbernat's and Cooper's ligaments with interrupted sutures of heavy black silk to prevent formation of hernia in this region. All small vessels were carefully ligated to result in an essentially dry field and the skin closed with vertical mattress sutures of fine black silk. At the close of the operation the entire left thigh, leg, and foot were of normal color and warmer than previously. The patient withstood the 4-hour operative procedure well and left the table in excellent condition.

Immediately upon ligating the arteries and veins proximal and distal to the fistulous tract, it was noticed that there was a slowing of the pulse and elevation of blood pressure; however, this slowing of the pulse rate was only transient, the pulse rate returning to

normal preoperative level by the end of the operation. However, the blood pressure, particularly the diastolic, remained elevated.

On the first postoperative day the patient volunteered the information that the lower extremity felt much lighter than previously, the extremity being warm and of good color. The patient had an uneventful postoperative course and was discharged three weeks following operation. The wound healed without incident except for accumulation of some serum which was aspirated on two occasions. At the time of discharge from the hospital the left leg and foot were smaller than previously (Table 1), warm, of good color, but there was still no pulsation of the peripheral arteries. The large varices were less prominent, some of them having thrombosed spontaneously. The ulcer on the leg had decreased from 3 to 1 cm. in size. The pulse rate was stabilized at preoperative level. There was no reappearance of the bruit or thrill in the left femoral region. This patient is being followed in the surgical out-patient department and has done very well except for the persistance of the ulcer on the lateral aspect of the leg which is gradually healing. He has returned to his former occupation and has no disability whatsoever in the left lower extremity except for slight aching in the calf after a day's work. There has been no reappearance of the thrill or bruit in the left femoral region.

DISCUSSION

1. Damage to the heart. The relationship between arteriovenous fistulas and cardiac damage has been definitely established by the clinical and experimental work of Reid and Holman. The degree of cardiac damage is directly related to the proximity of the fistulas to the heart and to the size of the fistulous opening; i.e., the closer to the heart and the bigger the fistulous opening, the greater is the amount of cardiac damage. In untreated cases of large arteriovenous fistula, the final outcome will be complete cardiac decompensation. Holman has demonstrated that the early evidence of the malign influence of a fistula upon the circulation, even before dilatation of the heart is detectable, is shown by the behavior of the blood pressure and pulse following closure of the fistula by digital pressure. An increase in the blood pressure and fall of the pulse rate indicate that the fistula is large and that it will eventually lead to cardiac decompensation.

In the patient presented, clinical symptoms indicating cardiac damage were not noted. However, on x-ray examination the heart was found to be enlarged and of the hypertensive type. Following closure of the fistulous opening the heart assumed a normal outline and decreased in size. Holman maintained that the cardiac damage is related to the increased blood volume which occurs in association with arteriovenous fistula. Reid could not confirm this either clinically or experimentally and explains eventual cardiac decompensation on a basis of increased pulse rate and increased cardiac output.

2. Behavior of the blood pressure and pulse rate. Slowing of the pulse rate upon closure of the fistulous opening (Branham's bradycardic phenomenon) is brought about reflexly due to the increase in blood pressure, which in turn is caused by increase in peripheral resistance. In the patient presented there was slowing of the pulse rate of 15 beats per minute, with elevation of the diastolic pressure of 30 mm. of mercury upon closing the fistulous opening. However, the slowing of the pulse rate was only transitory and returned to the original preoperative level upon discharge from the hospital. The change in blood pressure, however, was more constant, the diastolic pressure remaining elevated.

3. Circulation time. The patient under discussion presented a slowing of the circulation time distal to the fistulous opening. This is in accord with the clinical and experimental findings observed by Reid.

4. Oscillometric findings. The oscillometric findings merely helped to demonstrate that there is an impairment in the arterial circulation distal to an arteriovenous fistula. The decrease in the amplitude of the oscillometric pulsation is due to the fact that the blood supply distal to the fistula is no longer being carried on by the larger vessels, but through collateral channels.

5. Calorimetric findings. These findings are only further evidence that the circulation distal to the fistulous opening is impaired. There was an average decrease in

the skin temperature of 1 degree F. in the effected extremity as compared to the opposite normal one. Upon excision of the fistulous tract the skin temperature approximated that of the normal extremity, this being the result of a more adequate functioning of the collateral circulation following the elimination of the arterial spillway produced by the fistula.

6. Changes in the vessels. Venification of the artery (atrophy and dilatation of the artery proximal to the fistula) is associated with decreased strain on the arterial wall; decrease in arterial tension resulting in atrophy and dilatation of the vessel which causes it to assume the characteristics of the vein. In contrast, the thickening and dilatation of the vein (arterialization), proximal to the fistula, are the results of increased blood flow occurring in this vessel. Reid was able to demonstrate experimentally that there is no increase in pressure in the vein proximal to the fistula, but there is a tremendous increase in the volume of blood handled by this structure.

7. Further evidence of impairment of peripheral circulation. That the circulation distal to the fistula is markedly impaired is demonstrated by the absence of peripheral pulses, coldness of the part, and chronic ulcers which will not heal. When first seen, this patient showed an absence of peripheral pulsation in the affected extremity, with some coldness and a large ulcer. Following closure of the fistula, there was no significant change in the character of the peripheral pulsations, but the extremity showed an elevation of skin temperature and a gradual healing of the chronic ulcer, this being associated with improvement of the peripheral circulation.

DIAGNOSIS

The diagnosis of arteriovenous fistula can be suspected in any person with symptoms of cardiac decompensation coming on rather suddenly following previous injury, or in an individual with evidence of regional impairment of the circulation following injury. In an individual with injury to superficial large vessels the diagnosis can be confirmed by the presence of a pulsating tumor with palpable thrill and continuous bruit, accentuated during systole. In injuries to deeply placed vessels no palpable thrill need be present, but an audible bruit is almost invariably found.

TREATMENT

The treatment of traumatic arteriovenous fistulas should be delayed if possible until the development of extensive collateral circulation has occurred, after which quadruple ligation and excision of the fistulous segment may be carried out without danger of affecting the circulation distal to the fistula adversely.

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Fluorescent Light Is Not Harmful

Does fluorescent light possess harmful qualities not found in other forms of artificial illumination? The Council on Industrial Health of the American Medical Association says "No."

Following an investigation by a joint committee on Industrial Ophthalmology, the Council, through its secretary, C. M. Peterson, M.D., reports in the A.M.A. *Journal* of August 25:

"Fluorescent lighting is not harmful to vision. It should not cause eyestrain if properly installed and used."

It was found that the light from fluorescent lamps resembles daylight more closely than from tungsten-filament lamps. "This color resemblance to daylight," the Council reports, "is a desirable quality," adding:

"Infra-red energy found in fluorescent lighting as now manufactured produces no known physiologic effect except that due to heating. Fluorescent light generates less heat per candlepower than tungsten lamps.

"Glare occurs in any system of lighting... Excessive light may produce symptoms of eyestrain in susceptible individuals regardless of source. Constitutional factors should be corrected as well as the amount and kind of light."

+ Editorial +

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The Annual Session

The 156th Annual Session of the Medical Society of Delaware, Wilmington, October 8-10, is now a memory, but a very pleasant one. Despite the post-war difficulties, every essayist on the program was present, the papers turned out to be of unusual interest and value, the social features were more than pleasant, the official business was transacted with neatness and dispatch, and the attendance was larger than expected, totalling over one hundred members, or better than fifty per cent of the number now in the state.

The transactions of the House of Delegates will be published in the December issue of The Journal. The officers elected for the year 1946 are:

President, William C. Deakyne, Smyrna.

1st Vice Pres., Howard S. Riggin, Seaford.

2nd Vice Pres., W. Edwin Bird, Wilmington.

Secretary, C. Leith Munson, Wilmington.

Treasurer, William W. Lattomus, Wilmington.

Councilor, Clarence J. Prickett, Smyrna.

The House authorized the President to appoint a Budget Committee, and as a corollary of this Amendment to the By-Laws were proposed to (1) raise the dues to an adequate amount, and (2) to establish the office of Executive Secretary. These amendments will be acted on at the 1946 session.

The 17th Annual meeting of the Women's Auxiliary was held on October 10, with a business meeting in the morning, and with social features in the afternoon. The meeting was honored with an address by Mrs. David M. Thompson, president of the National Auxiliary.

Their officers were selected as follows:

President, Mrs. Erwin L. Stambaugh, Lewes.

Vice Pres. for New Castle Co., Mrs. George C. McElfatrick, Wilmington.

Vice Pres. for Kent Co., Mrs. Isaac J. MacCollum, Wyoming.

Vice Pres. for Sussex Co., Mrs. James Beebe, Lewes.

Record. Sec., Mrs. Sylvester W. Rennie, Wilmington.

Corresp. Sec., Mrs. Kenneth S. Brickley, Lewes.

Treasurer, Mrs. Albert J. Strikol, Wilmington.

Thus ended another session of our ancient Society and its Auxiliary; Presidents Chipman and Stambaugh and their assisting officers and committees are to be felicited on doing an excellent job.

BOOK REVIEW

TREATMENT IN GENERAL PRACTICE: By Harry Beckman, M.D., Professor of Pharmacology, Marquette University. Fifth edition, reset. Pp. 1070, illustrated. Cloth. Price $10.00. Philadelphia: W. B. Saunders Company, 1945.

This edition is just off the press and is the fifth to appear within fifteen years, ample testimony of its value to the practitioner. It has been reset and to bring it up to date many chapters have been rewritten, with much new material added to others. The seventy-two pages of bibliography is an indication of the monumental task involved in the preparation of this edition, which has been exceptionally well done. The global war has taken physicians and civilians to far-flung outposts and brought them in contact with heretofore little known diseases. These are included, with the best known present day treatment. Remedies of recent development, notably penicillin, are given with their indicated therapeutic application and dosage.

The following thirty one entities are included for the first time: Acute Infectious Lymphocytosis, Ainhum, Airsickness, Anaphylactic Shock, Atypical or Virus Pneumonia, Benzol Poisoning, Blast Syndrome, Boutonneuse Fever, Bullis Fever, Cardiogenic Shock, Cerebral Shock, Chemical Burns, Crush Syndrome, Dimorphic Anemia, Epidemic Influenza, Gas Gangrene, Human Serum Jaundice, Idiopathic Hypoprothrombinemia, Periodic Mastalgia, Phosphorus Poisoning, Primary Shock, Rh Factor, Syndromes Salmonella Food Poisoning, Secondary Shock, Shellfish Poisoning, Subclassical Deficiency States, Sulfonamide Sensitization, Surgical Shock, Thermogenic Anhidrosis, Toxoplasmosis, Urogenital Syndrome.

The fifth edition maintains the high Beckman standard and in the opinion of this reviewer is still the best work published today on treatment in general practice.

STATEMENT OF OWNERSHIP, MANAGEMENT, CIRCULATION, ETC.

Required by the Act of Congress of August 24, 1912, and March 3, 1933, of The Delaware State Medical Journal, Published monthly at Wilmington, Delaware, for October 1st, 1945.

STATE OF DELAWARE } SS.
COUNTY OF NEW CASTLE }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared M. A. Tarumianz, M.D., who, having been duly sworn according to law, deposes and says that he is the Business Manager of the Delaware State Medical Journal and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Name of— Post Office Address

Publisher, The Star Publishing Co., 309 Shipley Street, Wilmington, Del.

Editor, W. Edwin Bird, M.D., 822 North American Building, Wilm., Del.

Associate Editor, W. O. LaMotte, M.D., Medical Arts Bldg., Wilm., Del.

Managing Editor, M. A. Tarumianz, M.D., Farnhurst, Del.

2. That the owner is: (if owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

The Medical Society of Delaware

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

None

4. That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is ———— (This information is required from daily publications only.)

M. A. TARUMIANZ, M. D.
(Signature of Business Manager)

Sworn to and subscribed before me this 28th day of September, 1945.

(SEAL)

MARY S. RHODES
Notary Public
(My commission expires April 1, 1945)